

REMARKS**Status of the Claims**

In the Final Rejection, presently outstanding claims 10-30 were rejected. Claims 10-15 have been cancelled without prejudice. Upon entry of the foregoing cancellations, claims 16-30 will be pending. No new matter has been added.

In view of the foregoing cancellations and the arguments that follow, Applicants respectfully request withdrawal of all rejections upon reconsideration.

The Present Invention

The present invention relates to a catalyst, its preparation, and its use, especially for the production of 1,2-dichloroethane by the oxychlorination of ethylene in a fluidizable or fixed-bed reactor.

Rejections Under 35 U.S.C. §102(b)

Claims 16-30 were rejected as allegedly anticipated by Convers et al. (U.S. Pat. No. 4,460,699, "Convers"). Applicants respectfully traverse this rejection.

In order for a prior art reference to be anticipating, "every element of the claimed invention must be literally present, arranged as in the claim." *Richardson v. Suzuki Motor Co., Ltd.*, 868 F.2d 1226, 1236 (Fed. Cir. 1989). Applicants respectfully request reconsideration of this rejection, as Convers fails to teach or even suggest every element of the claimed invention.

The Final Rejection asserts, *inter alia*, that Convers "discloses a fixed bed catalyst for oxychlorination comprising thin layers of high specific surface area material, gamma alumina, and salts of copper, magnesium, and lithium." (Final Rejection at page 2.) Convers, however, describes a catalyst in which an oxychlorination agent (e.g. copper) is layered onto or dispersed in a carrier material (e.g. magnesia alumina) layered on a particle (e.g. alpha alumina). A metal salt layer may also be present, but is necessarily on top of the oxychlorination agent. As a result, the order of layers in the Convers catalyst

is impeded center, followed by catalyst carrier material, followed by oxychlorination agent (e.g. copper), optionally followed by a metal salt. (See, for example, Convers claim 6 at column 12, lines 14-43).

Applicants note the Examiner's statement that "as Applicant appears to admit, the cited prior art discloses a catalyst comprising a support and thin layers (plural) of the claimed materials, the claim is anticipated." (Final Rejection at page 4.) Applicants respectfully point out, however, that the statement cited above was merely a direct quotation of a statement made by the Examiner in the previous Office Action. Applicants have not expressed agreement with or admission of this statement.

In contrast, the claims of the present invention recite a process and a particle formed thereby consisting essentially of gamma alumina, followed by a layer containing magnesium and then a layer containing copper and, optionally, lithium. As a result, the order of the catalyst layers is gamma alumina, followed by magnesium salt, followed by copper salt and optionally lithium salt. (See, for example, claim 16, and the specification as originally filed, page 4, lines 35-37.) Convers does not disclose or even suggest a particle consisting essentially of gamma alumina covered by a layer of magnesium and then a layer of copper (with or without lithium).

In addition, the Final Rejection asserts that the above specified order of layers of the present invention is "not recited in the rejected claim(s)," and that "[a]lthough the claims are interpreted in light of the specification, limitations from the specification are not read into the claims." (Final Rejection at page 4.) On the contrary, Applicants believe that the order of the layers (a copper-containing layer which is on top of a magnesium-containing layer which is on top of the gamma alumina) is readily apparent and is required from the language of the claims.

For example, independent claim 16 recites:

- A process for preparing a catalyst comprising the steps of:
- (a) impregnating γ -alumina with a solution containing magnesium salt;
 - (b) drying the product of step (a); and
 - (c) impregnating the product of step (b) with a solution containing a copper salt and, optionally, a lithium salt.

The way in which these steps are set forth leaves no option other than performing step (a) before step (b) and step (b) before step (c). For example, a product (step (a)) is necessarily formed before it is dried (step (b)), and step (c) recites a manipulation of a product of step (b).

Conversely, one could not perform step (c) before steps (a) or (b), or step (b) before step (a), because of the logical order of the claims. Step (a) recites impregnating the catalyst support with a magnesium salt. No drying of the magnesium layer can occur until the magnesium layer is provided, therefore step (a) must come first. Step (b) recites drying the product of step (a). Hence, in order to accomplish step (b), the layer of step (a) must have already been provided. Step (c) recites impregnating the product of step (b) with a copper salt. In order to do so, the product of step (a) must have already been dried. Therefore, step (b) necessarily comes before step (c). Because the layer of step (a) must have already been provided and dried before it can be impregnated with a copper salt, step (c) must come after both steps (a) and (b).

Similarly, by following the steps in order, the order of the layers of the resulting product can only be gamma alumina, followed by magnesium, followed by copper. When “the sequential nature of the claim steps is apparent from the plain meaning of the claim language and nothing in the written description suggests otherwise”, the steps of the process claim *must* be performed sequentially. See *Mantech Environmental Corp. v. Hudson Environmental Services, Inc.*, 152 F.3d 1368, 1376 (Fed. Cir. 1998)(emphasis added). Such is the case in claims 16 through 30 of the present application. Claims 16-30 recite a process or composition wherein layers in a defined order are present. Because *Convers* fails to teach or suggest such ordered layers, claims 16-30 are not anticipated.

Additionally, Applicants respectfully point out that the catalyst layers are applied in the order specified above because the magnesium layer reacts with the γ -alumina support to form a magnesium aluminate coating, thus preventing an appreciable amount of copper from reacting with the γ -alumina. If not for the layer of magnesium between the γ -alumina and the copper, the copper layer would interact with the γ -alumina to form copper aluminate, which is *inactive* in oxychlorination, thus defeating the purpose of the

invention. Instead, because the layers of the present invention are in the above-specified order, all or substantially all of the copper is available for catalyzing the oxychlorination reaction. (See, for example, the specification as originally filed at page 5, lines 23-27, page 6, lines 11-12 and 23-34, and page 7, lines 12-17.)

In view of the foregoing, Applicants respectfully request that the rejection under 35 U.S.C. §102(b) in view of U.S. Pat. No. 4,460,699 be reconsidered and withdrawn.

Applicants consider the above statements to be a full and complete response to the Examiner's rejections under 35 U.S.C. §102(b). Should the Examiner disagree, however, Applicants respectfully request that the Examiner suggest alternate claim language that would, in his opinion, recite the order of the claimed method steps more clearly.

Conclusion

Applicants believe that the foregoing constitutes a full and complete response to the Final Rejection of record. Accordingly, an early and favorable Action is respectfully requested. Applicants invite the Examiner to contact the undersigned at 215-557-5966 to discuss any issues unresolved by this response.

Attached hereto is a marked-up version of the changes made to the claims by the current Response to Final Rejection. The attached page is captioned, "**Version With Markings to Show Changes Made.**"

Respectfully submitted,

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Version With Markings to Show Changes Made

In the Claims:

Claims 10-15 have been cancelled.

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